3GPP TSG RAN Rel-18 Workshop
June 28th – July 2nd 2021

RWS-210108
Agenda Item 4.2

[non-eMBB] URLLC Enhancements

MediaTek Inc.

eMBB consumer

MIMO
- CSI enh.
- BM: [subject to R17]
- Stationary: 8Rx, overhead redux
- UL sub-band precod.
- UL 4+ layers

DC/CA Enh.
- X-carrier HARQ: feedback & re-Tx
- Fast re-Tx split bearer
- Temporal RS PScell act
- Scalable x-carrier sch.

XR/CG Enh.
- QoS+, x-layer opt.

MBS
- SFN+
- QoS+ (Tput, reliab.)
- TV (ATSC3.0 ref)

NW Topology

Sidelink LLeMBB
- SL-U esp. <7GHz, FR2
- Low latency 1Gbps
- SL-U RedCap

Sidelink Relay
- U2U relay
- UE scheduling UE
- mPath, mHop
- Mobility (Remote, Relay)
- Network coding

Smart Repeaters
- Beamforming
- Interf. Mgmt (T/F DD)
- Integration (UE authorization)

NTN Evolution

NTN NR
- Mobility
- Regenerative arch
- HD-FDD, VoNR, MBS
- R17 leftovers

NTN IoT
- Mobility (connected)
- R17 leftovers

SID Spectr. sharing
- Study scenarios, target spectrum and regulation status

Long-term explor.

SID AI/ML integr.
- NG-RAN/AS integrat.
- DMRS ch. est., Rx noise suppress, CSI-RS overhead, CSI feedback
- (UE-based) Mobility predict., Pos. enh.
- NW functions (load balancing, radio resource planning..)

SID AI traffic
- Traffic and arch.
- Overhead optim.

SID >71GHz
- Spectrum charac.

Common tech.

[FR2] Mobility
- L1/L2 trig. CHO
- Inter-/intra-cell beam switching delay redux
- RRC DAPS HO mPanel

System Energy
- DCI-based pwr sav mTRP and mPanel
- gNB/TRP dormancy (UE -trig. / -imposed)
- Eval. Methodology (Pwr. Cons. Models)

POS (NR, SL, RedCap)
- cm-level (Tx + meas related to signal ϕ)
- SL (-based, -assisted)
- RedCap UE
- R17 leftovers

SID gNB Full Duplex
- Partitioning, scenarios, interf.

Verticals

URLLC
- DL control efficiency
- NR-U enh

RedCap
- PA-less
- (POS)
- NO LPWA

(UAV: neutral)

SID = SID only Others: SI+WI / WI

Sorting for 3GPP RAN#92e Rel-18 Workshop

eMBB

MIMO
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- Low latency 1Gbps
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XR/CG Enh. [SA-led]
- QoS+, x-layer opt.

NTN NR
- R17 leftovers
- Mobility
- Regenerative arch
- VoNR, MBS, HD-FDD

MBS
- SFN+
- QoS+ (Tput, reliab.)
- TV (ATSC3.0 ref)

(may also be seen as non-eMBB)

Non-eMBB

URLLC
- DL control efficiency
- NR-U enh

RedCap
- PA-less
- (POS)
- NO LPWA

NTN IoT
- R17 leftovers
- Mobility (connected)

(UAV: neutral)

X-areas New areas

System Energy
- DCI-based pwr sav mTRP and mPanel
- gNB/TRP dormancy (UE -trig. / -imposed)
- Eval. Methodology (Pwr. Cons. Models)

[FR2] Mobility
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SID NTN *f* sharing
- Study scenarios, target spectrum and regulation status

SID gNB Full Duplex
- Partitioning, scenarios, interf.

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URLLC Enhancements
RAN1-led

3GPP TUs (Total w/ 9 meetings)			
RAN1	RAN2	RAN3	RAN4
8	5.5	-	2

SA/CT Dependency: No

Capacity enhancements for latency-critical applications

Objective I: Improved DL control efficiency [RAN1, 2]: Due to the high reliability and small packet size, the control-to-data overhead ratio is larger compared to eMBB services

- CSI feedback for PDCCH:
  - Different coding scheme used for PDCCH
  - The observed interference on the PDCCH resources is different from PDSCH resources
  - CSI reported for PDSCH doesn't represent well the CSI for PDCCH
- Introducing intermediate aggregation levels:
  - Limited link adaptation for PDCCH (only 5 aggregation levels) compared to PDSCH

Objective II: NR-U Enhancements [RAN1, 2]

- Increase UL Tx opportunities (PUSCH, PUCCH, SR) in frequency/time domain: to reduce the impact of channel access blockage
- PDCCH monitoring enhancements across LBT bands: Splitting the CCEs/BDs budget across LBT BWs including the unsuccessful LBTs compromises the reliability of control channel
- Enable NR-U features via compact DCI

Objective III: UE processing time reduction for FR2 [RAN1]

Thank You!

MediaTek TDocs to RAN Rel-18 Workshop

RWS-210092	MediaTek Views on Rel-18 content	MediaTek Inc.
RWS-210093	[eMBB] MIMO Enhancements	MediaTek Inc.
RWS-210094	[eMBB] DC/CA Enhancements	MediaTek Inc.
RWS-210095	[eMBB] XR/CG Enhancements	MediaTek Inc.
RWS-210096	[eMBB/Other] MBS Enhancements	MediaTek Inc.
RWS-210097	[eMBB] Sidelink Enhancements - LLeMBB	MediaTek Inc.
RWS-210100	[eMBB] NTN NR Enhancements	MediaTek Inc.
RWS-210101	[non-eMBB] NTN IoT Enhancements	MediaTek Inc.
RWS-210108	[non-eMBB] URLLC Enhancements	MediaTek Inc.
RWS-210109	[non-eMBB] NR RedCap Enhancements	MediaTek Inc.
RWS-210098	[x-area] Sidelink Relay Enhancements	MediaTek Inc.
RWS-210099	[x-area] Smart Repeaters Enhancements	MediaTek Inc.
RWS-210102	[x-area] NTN/TN Spectrum Sharing	MediaTek Inc.
RWS-210103	[x-area] AI/ML Integration	MediaTek Inc.
RWS-210104	[x-area] AI/ML Traffic	MediaTek Inc.
RWS-210105	[x-area] Mobility Enhancements	MediaTek Inc.
RWS-210106	[x-area] System Energy Enhancements	MediaTek Inc.
RWS-210107	[x-area] Positioning Enhancements	MediaTek Inc.
RWS-210197	[x-area] Sub-band Full-duplex for gNB	MediaTek Inc.
RWS-210110	Draft WID: System Energy Enhancements	MediaTek Inc.
RWS-210111	Draft WID: Mobility Enhancements	MediaTek Inc.
RWS-210112	Draft WID: DC/CA Enhancements	MediaTek Inc.
RWS-210113	Draft WID: NTN IoT Evolution	MediaTek Inc.